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Learning objects in theory and practice: A vision from Mexican University teachers

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ABSTRACT

Drawing on the experience of development and use of a virtual learning environment (VLE) at a public Mexican university, this article explores the tension between the most common definitions and attributes of learning object (LO) in the mainstream literature, and the teacher's practices around the creation and incorporation of LOs in the VLE. This experience shows that attempting to define LOs from strictly technical or industrial parameters might be limiting in the context of educational institutions, since teachers are developing and using LOs effectively, despite their little adherence to prescriptive definitions. Yet it is important to support teachers in order to take advantage of the interactive and multimedia potentialities afforded by this technology, instead of using it mostly for delivering static content.

1. Virtual environments and learning objects

The interest on virtual learning environments (VLE), also known as Learning Management Systems (LMS); Course Management Systems (CMS); or Learning Content Management Systems (LCMS), has grown in the last decade. Statistics on VLE software use report an exponential growth. Moodle, for example, has over 50,000 sites registered (Dougiamas, 2008). Likewise, the number of articles in ISI Web of Knowledge containing any of the mentioned terms in their title or topic, shows also a sustained growth between 1999 and 2008 (see Fig. 1).

VLEs are used in multiple forms: in on-site, distant or blended education; with static or dynamic contents; with or without interactivity; organizationally or personally. Generally, VLEs offer clear advantages, both administrative and academic. However, these depend on how they are used in practice. A VLE is an empty structure, wonderful in its potential but empty. It needs to be shaped, and populated with digital resources and interactions. It should also be designed in ways that are useful and attractive for the students to engage in it.

As the use of new technologies of information and communication (TIC) spreads in educational settings in Mexico and other nations, institutional reports about the amount of computers or software acquired also multiply; yet they rarely precise how the TICs are used and what real benefits they render to teaching and learning. Likewise, with the current spread in the use of VLEs in both on-site and distance education, it is possible that we are initiating a new stage in which reports will read "we have such and such VLE," without specifying its use and benefits.

To avoid this risk, institutions and teachers must consider and decide if a VLE is convenient or not, which one to select, how to design it, what to include within, and how to manage it. Yet a central aspect to be considered is the type of entities being placed within a VLE, and which ones should be there. The mainstream literature argues that the so-called learning objects (LOs) are the essential element to distribute contents and afford interactions through a VLE. Indeed, the concept of LO itself, and its distinctive attributes are object of debate in the literature (Wang & Hsu, 2006). For example, Ip, Morrison, and Currie (2001), after analyzing the use of technological resources within ten different pedagogic models, concluded that the term "learning object" is not native to the educational community, and that a gap between the technology and the educational communities exists, since the latter is little interested on matters of reusability, granularity, or technical properties of the "LO". Churchill (2007), on the other hand, argues that the concept of LO remains ill-defined, despite its extensive discussion in the literature; and suggests a categorization of six different types of LO, understood as representations designed to afford uses in diverse educational contexts. Finally, Bennett and McGee (2005) remind us that although much has been written about the criteria that

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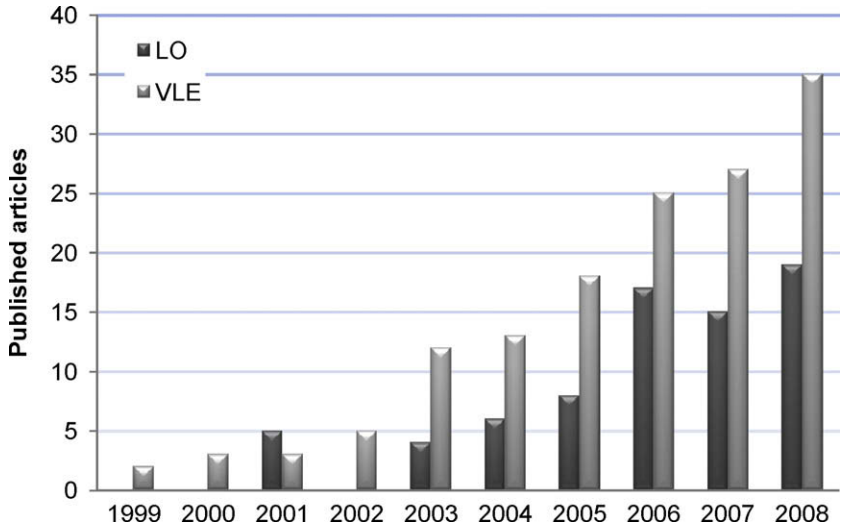

Fig. 1. Articles in ISI web of knowledge containing the terms VLE, LO, and their variants source: search in ISI web of knowledge, using results analysis.

should guide the development, storage, and access of LOs, much less has been written about how they are designed and used in practice; and they conclude that we are now prepared to move forward realistically, and shift our thinking from 'definition' to 'design'.

Responding to Bennett and McGee call, in this article we present our experience in the implementation of the VLE InteligenciaNet, and analyze the type of LO used in practice by the participant teachers. Then we review the most common definitions and attributes of LO in the literature, and explain those definitions and attributes in language closer to educators. We finally analyze the tension between prescriptive definitions of LO and their practical uses by actual teachers, and suggest ideas to support educators and authorities of academic organizations in the conception, production, and use of LO linked to a curriculum and embedded in a VLE.

2. Learning objects in practice

2.1. InteligenciaNet

InteligenciaNet (http://www.inteligencianet.com) is a VLE (based in Moodle) created in 2006 by two teachers working on the implementation of online graduate courses. In its origins, InteligenciaNet included only four courses taught by the two authors of the environment; yet other teachers were progressively joining the VLE, as they took teacher development courses conducted by the authors of InteligenciaNet. As a result, in the current school year (2008–2009), InteligenciaNet hosts resources for over 25 subjects of 10 programs, including sciences and humanities, within the National Autonomous University of Mexico (UNAM), the most important public university in Mexico. The current number of participants or users of InteligenciaNet is 12 teachers, creators of courses; over 2400 students; and around 100 users not affiliated to UNAM. Most of the resources in InteligenciaNet have been freely included by faculty members, according to their needs, interests, and understanding on how to use the VLE.

A goal of InteligenciaNet has been to introduce the idea of LO as a norm that can benefit both individual users (teachers and students) and the organization, because of its qualities of reusability, flexibility, durability, and accessibility, according to the mainstream literature on LO. Yet, a careful revision of the actual content in InteligenciaNet shows that the teachers' understanding and practices within the VLE diverges from the standard definitions of LO in the literature.

2.2. Method

To document with more precision this finding, we gathered data and recorded some indicators of the uses that the teachers give to the VLE. Specifically, we focused on three elements in our data collection: contextual information about discipline and years of teaching practice; course organization (thematic or temporary), and kind of resources and activities (LO created by the teachers or links to web resources; static or dynamic LO; plain text or multimedia). For these three aspects we relied on information available through the VLE, such as course descriptions, resources and activities created or uploaded by the teachers. Contextual information was obtained from short interviews with the teachers.

2.3. Results

Data were organized in two tables. Table 1 shows general data about the courses. Table 2 presents the contents incorporated by the teachers according to the two possibilities of aggregation afforded by Moodle: resources and activities. The distinctive characteristic of the latter is that these enable the recording of user interactions. As for the resources, they were divided in own (column A), that is those created by the teachers, and external (column B), when the teacher places a hyperlink to a content in an external website.

Seventy two percentage of the courses shown in Table 1 were taught by teachers with over 20 years of teaching experience. Most of them are in the areas of mathematics and computer sciences, as well as in courses of teacher development. Also, 72% of the courses are organized by topic, and the rest by week (the courses taught by the authors of InteligenciaNet). Practically all courses include their syllabus.